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ABSTRACT

This paper describes computer and distance-education technologies in the South Western Educational Region of Queensland (Australia). The South Western Region is characterized by isolation, small schools, high teacher and principal turnover, teacher and principal inexperience, student mobility, pockets of social and economic deprivation, and many students of aboriginal origin. For the past 2 years, advancements in the region's educational technology has been dominated by the Queensland Department of Education Learning Systems Project. The project encompasses: (1) establishment of business education centers in secondary schools, focusing on use of computers and other modern business technologies; (2) implementation of electronic learning centers in primary and secondary schools; (3) introduction of a practical computer methods course into years 11 and 12; (4) installation and establishment of telelearning sites in remote areas, thereby greatly expanding curriculum options; and (5) extensive professional development for classroom teachers and school communities. Regional initiatives have provided equipment and training related to electronic communication since 1987, supplied facsimile machines to all of the smallest and most isolated schools, and created an integrated program for the repair and maintenance of all computer hardware and accessories. (SV)

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LEARNING TECHNOLOGY PROGRAMS IN AN ISOLATED REGION - CLASSROOM APPLICATIONS OF TECHNOLOGY

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South Western Region, Queensland

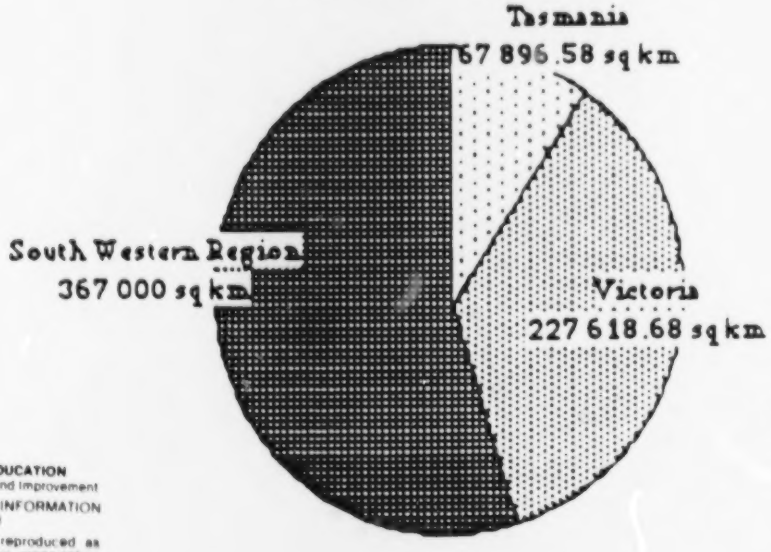
Background Information on the South Western Region

The South-Western Education Region comprises the local authority areas of Balonne, Bendemere, Booringa, Bulloo, Bungil, Chinchilla, Murilla, Murweh, Paroo, Quilpie, Roma, Tara, Taroom and Warroo.

The South Western Region extends approximately eleven hundred kilometres from east to west and five hundred kilometres from north to south. The area may be regarded as a broad transition zone between the fertile farming lands of the Darling Downs, through the mulga scrub and open grasslands, to the desert margins of Central Australia.

The South Western Region covers an area of approximately 413 100 square kilometres. It is 1.8 times the size of Victoria and six times the size of Tasmania.

Comparison of Areas



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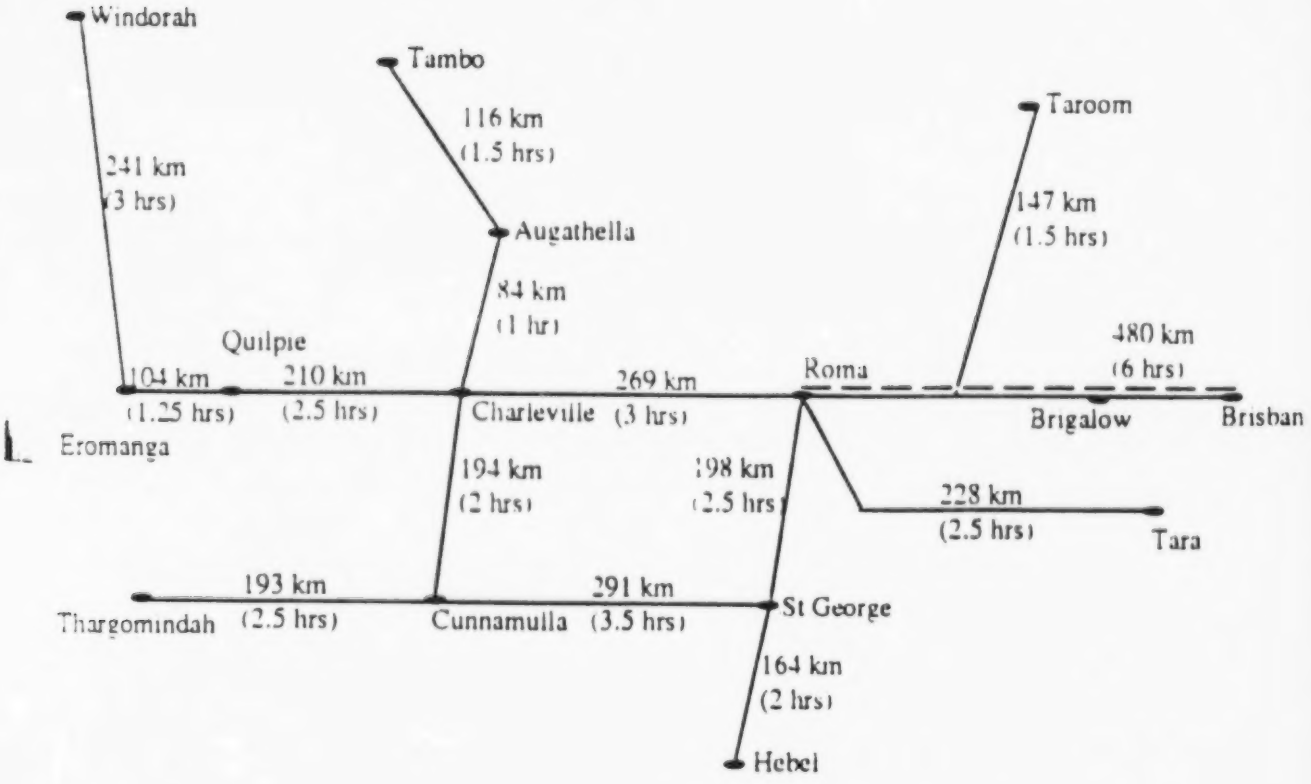
In all parts of the Region, but most particularly in the western half, isolation and distance to schools and between schools, are a major difficulty for administrators, teachers, parents and students alike.

Distance in South Western Region



Educational facilities in the South Western Region comprise four state high schools, a senior college, a middle school (years 4 to 10), a junior school (preschool to year 3), a school of distance education, a special school, an environmental education centre, ten secondary departments attached to primary schools, as well as fifty-five primary schools. Of these twenty-seven are one teacher schools. Special education units are attached to the primary schools at Charleville, Chinchilla and Cunnamulla. There are

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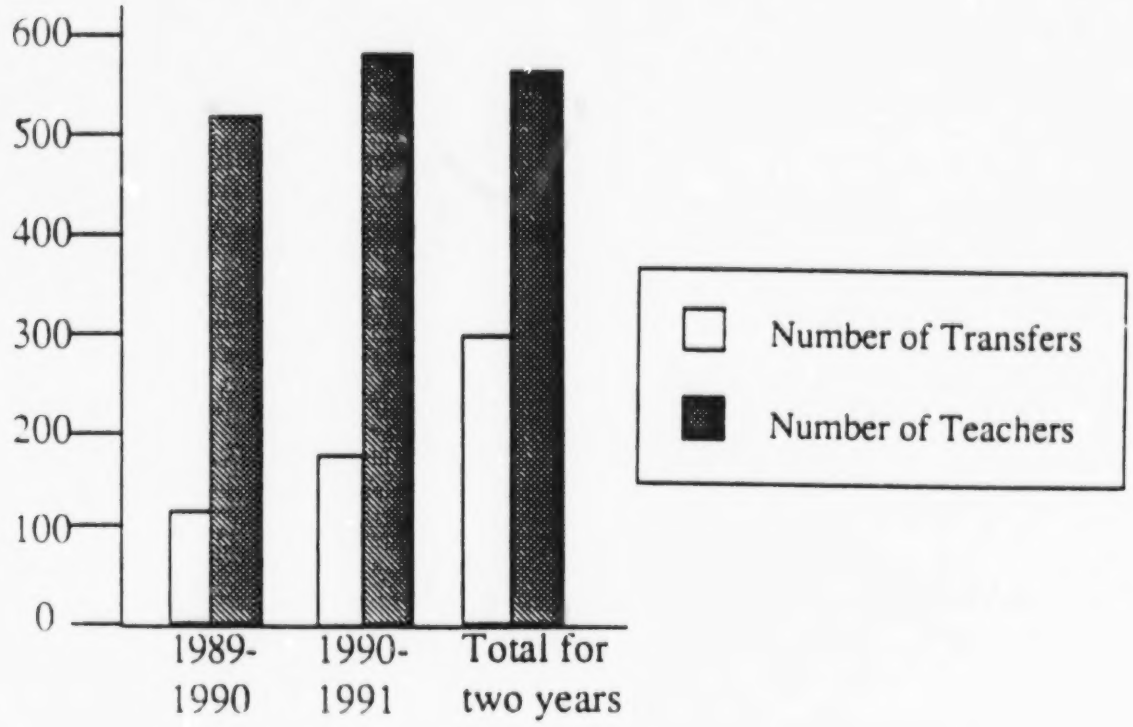
Transfers in South Western Region



There is also a high turnover of teachers in the region each year.

Introduction

In the South Western Educational Region the area of technology over the past two and a half years has been dominated by the Queensland Department of Education Learning Systems Project.

The Learning Systems Project in the South Western Region encompasses:

* the establishment of Business Education Centres in secondary schools and secondary departments;

* the implementation of Electronic Learning Centres in primary and secondary schools;

* the introduction of the subject Practical Computer Methods into Year 11 and 12;

* the installation and establishment of Telelearning sites for remote areas; and

* extensive professional development for classroom teachers and school communities.

The South Western Region adopted these projects and a plan for implementation over a three year period was devised by the regional consultants, one full-time person based in Roma and one part-time person based in Charleville. These consultants cover vast distances each week working in secondary schools through to preschools, classrooms to property homes.

Quality communication is essential in our region where isolation is caused by distance and lack of facilities. For this reason, a regional initiative of providing equipment and training for the use of electronic communication via Keylink was approved, and a program put in place in 1987. In 1990 this program has been extended to the supply of facsimile machines to all class four and five schools (one to four teacher schools) in the region. Due to the location of these schools and irregular, infrequent mail services, this type of technological equipment attempts to overcome some of the frustration caused by the isolation and distance factors. This high profile program must be continually maintained due to the high turnover of staff in our small schools.

In addition to these projects, an integrated program for the repair and maintenance of all computer hardware and accessories has been continually serviced and maintained. The South Western Region is the only educational region in Queensland which can boast that every school in the region has their own computers, modem and printers for daily use by students. With this large volume of equipment, this maintenance and repair program is very necessary. We are very lucky that the South Western Priority Country Area Program assists our isolated schools in this matter.

Finally, the provision and installation of computers and electronic communication facilities for use by children on properties studying through

the School of Distance Education is an important facet of technology in our region. Both the Queensland Department of Education and the Priority Country Area Program have contributed to this initiative which has proven to be a success.

Learning Systems Project

The Learning Systems Project is a $20 million, three year project initiated by the Queensland Government to enhance the use of technology in education. Rather than distribute computer equipment widely across as many schools as possible, the strategy adopted in the Learning Systems Project is to concentrate critical masses of equipment and skills to ensure effective change in the outcomes of learning.

The Learning Systems Project was planned to build expertise, layer by layer, throughout the state. Equipment has been deployed where it can best sow the seeds of future development in learning technologies. Early work in computer education is now providing the basis for the continuing implementation of this important project.

Business Education Centres

Technological change over the last decade has transformed the office environment. Businesses have introduced multi-function computers, new telecommunication networks and copying devices to facilitate operation and management of modern offices. As a result, business practices have changed from manual or mechanical operations to the use of sophisticated computer and telecommunication systems and their associated software applications. These application areas include:

* word processing;
* desktop publishing;
* spreadsheets;
* accounting packages;
* electronic filing;
* databases;
* graphics;
* electronic time management;
* electronic mail;
* teleconferencing;
* videotext; and
* reprographics.

Businesses need personnel who are knowledgeable in commercial practices, skilled in the use of information and telecommunications technology, can demonstrate initiative and can work effectively without direct supervision in this new environment. As a result, the classroom experiences of students studying business courses need to correspond more with the kind of physical and operational environments which they are likely to encounter when they graduate from school.

The purpose of the Business Education Centre project is to establish learning centres in the commerce areas of secondary schools and departments where students will be offered relevant curriculum using a range of modern business technologies.

The central focus is the curriculum rather than the technology. Instead of developing subjects or units that focus on the technology itself, the use of technology is to be integrated across the curriculum or units that focus on the technology itself, the use of technology is to be integrated across the commerce curriculum. This process may lead to a change in the curriculum in some subjects. It may also lead to a more collaborative approach to learning on the part of both teachers and students. It is expected that students will become more responsible for their own learning, thus developing the necessary abilities and attitudes for effective operation with a modern business environment.

Business Education Centres in the South Western Region have been established in such a way that the physical environment, classroom practices and learning experiences for students mirror, as closely as possible, what is happening in business. They physical environment is arranged to resemble the kinds of co-operative work groups used in most businesses. Naturally, the constraints of accommodating classes, suitable furniture and furnishings, power, security, communication facilities and of course last but most constraining, available funding, were major considerations in the planning processes.

Within a classroom arranged around work groups, students have the opportunity to learn as a whole, in smaller groups, in pairs or as individuals. At any one time students can be involved in a range of computer applications, that is, they do not have to be working on the same activity at the same time.

As you can imagine, the funding required to establish a centre of this nature is great, however, schools were allocated funding using a formula based on the number of students enrolled in commercial classes, the number of commercial teachers and the number of minutes of commercial tuition. Hence, schools in the South Western Region did not receive adequate funding to establish such centres. Vast amounts of fund raising activities were held, contributions from the school administration and of course, sponsorship from the local communities. Without the school communities which support these small schools, Business Education Centres in the South West would not have survived.

Teachers and students alike found themselves practising the entrepreneurial skills required for small business. The need to sell their skills and abilities was necessary and plans were devised for the marketing of these skills in such a way as to be attractive to local business houses. Soon local businesses were sporting business cards, professionally printed menus in the cafe, desktop published breakfast menus in the motel or guest house, advertisements for the local newspapers, wedding and party invitations for community members and evening classes for the computer illiterate. Funds generated from these business ventures were recycled back into the Business Education Centre for the purchase of further equipment and consumable stock.

Electronic Learning Centres

For a period of seven years before the implementation of the Learning Systems Project, the Queensland Department of Education made a considerable investment in computer technologies for schools. Most schools made an effort to expose students to this technology and this was mainly by way of computer literacy courses. Less work was done on the use of computer technology as a curriculum tool.

Over the past two and a half years with the implementation of Electronic Learning Centres, teachers have been encouraged to make greater use of computers and related technology within the curriculum.

A prominent expectation of the community and Government is that schools equip students with skills in the use of information technologies for both learning and employment. The focus of this project has been to embed the

use of information technology in common classroom practice. The project aim was to develop a critical mass of teachers who use technology in appropriate ways across the curriculum. This in turn has required significant changes to approaches to curriculum implementation and teaching styles.

Electronic Learning Centres have been established in the South Western Region with the purpose of equipping students with adequate technological skills to function effectively in an information society. Curriculum development, supported by appropriate technological hardware, software and peripherals, have been major project focuses. . Schools have given a commitment to the development of curriculum materials and student programs, and these are distributed through the Regional Learning Systems Consultants.

Students have and are in the process of coming to terms with technology as a matter of course within the context of their schooling. The role of the teacher has had to change to that of facilitator instead of director, and learning and teaching styles have been adapted to suit the new environment which has been created in the classroom.

In the South Western Region the majority of the Electronic Learning Centres that have been established focus predominantly on curriculum integration in the primary school with sub-themes of language and theme development. One centre is located in the Manual Arts Department of a Secondary Department at Wallumbilla where students utilize the computer hardware in conjunction with drawing programs and plotters for the subject Graphics (Technical Drawing). Another centre specializes in the field of music, where piano keyboards are connected to Ataria computers for the composition of music and printed scores.

One of the most unique Electronic Learning Centres in Queensland affectionately known as 'Technology through the Heat and the Dust' is located on properties in the South Western Region. This centre services children on properties who are enrolled in the School of Distance Education, Charleville Centre. These computers and associated software and learning materials are rotated on an annual basis to allow other students access to this equipment and instructional program. The Commonwealth funded South Western Priority Country Area Program have undertaken an initiative to extend this centre with more hardware and software in an attempt to give

a greater number of families the same opportunities that would be afforded to their students if they attended school on a daily basis.

Practical Computer Methods

Practical Computer Methods is a subject offered by secondary schools throughout Queensland to Year 11 and 12 students. It was introduced to enhance the range and relevance of senior secondary curriculum offerings to the increasing number of students enroling in Year 11 - 12 studies.

The Practical Computer Methods syllabus was probably the best example of a course which would fulfil the Government's Strategic Development Plan for Queenslanders to become technologically advanced and more innovative and entrepreneurial. This course has no equal in other states.

While all secondary schools and departments were issued with the basic computer equipment under the Computer Literacy Project, additional hardware needs to be provided to cater for graphics, communications, and software for programming, information processing and artificial intelligence.

This specialised subject was initially introduced only to those schools with existing acceptable levels of hardware, software, teacher expertise and teaching resources. Through the Learning Systems Project schools were allocated additional equipment to cater for the increasing demand for such a computer course. Professional development and support for teachers became essential and the development of curriculum support materials was provided to teachers of the subject by Curriculum Services Branch of the Queensland Department of Education.

All secondary schools in the South Western region and secondary departments with extended campuses to Year 12 have introduced this new subject into their curriculum within the last two and a half years. It has become very popular and classes have doubled within this short time period.

Telelearning Project

Students living in isolated rural areas face special problems compounded by the trends larger agricultural holdings and more capital intensive rural industry which have further diminished already small scattered populations. Even in areas where small schools exist, student numbers impose limits on the range of subjects that can be taught. At the same time, there is widespread community expectation that curriculum options should be expanded to encourage students to stay longer at school. Emerging telecommunications strategies have been used successfully in the South Western Region to help bridge this gap in rural communities.

An analysis of a variety of telecommunications activities in support of remote learners points the way to means of more efficiently and productively using resources within clusters of schools.

Moreover, the benefits of this approach are not restricted to students in remote areas. Learners in more populated communities can also use telecommunications to meet specific educational needs. In such communities, telecommunications can improve the cost efficiency of providing specialised subjects with limited appeal.

Preliminary investigations reveal a potential cost efficiency in delivering the curriculum using telecommunications. A network of schools can utilise highly qualified teachers across a broader spectrum of subjects than is currently possible. Subjects which were formerly unavailable to small groups of students scattered across a region can now be readily offered via telecommunications techniques.

In the South Western Region a trial was initiated in 1990 between Charleville State High School and Miles State High School, 450 kilometres apart. Students in Year nine at Miles undertook Japanese lessons rom a highly qualified teacher in Charleville, while Year eleven students at Charleville received Agricultural Science tuition from a specialist teacher based in Miles. This project has been operating very successfully for the past eighteen months.

This year another centre has been established operating between Roma and Surat (one way only), with further plans for lessons to also be

transmitted to Mitchell in 1992. The teaching of the French language is the focus of this centre.

These projects address issues of efficiency and productivity at the regional level by delivering curriculum materials to students via a telecommunication system. While efficiency and productivity are the long term objectives, the educational efficacy of such an approach has been a parallel consideration. Similar projects overseas have adequately demonstrated the educational effectiveness of the process.

Communication Facilities

There are four main forms of communication facilities available to all of us as educators. These are:

* surface mail;
* telephone;
* Keylink; and
* facsimile machine.

As educators it is important we are aware of the modus operandi and consequent benefits, both practical and cost effective, of the four mediums and the place each has to play within our daily routine. We need to recognise the most appropriate medium to use for a particular task.

Principals and teachers need to be able to make educated, informed decisions concerning the use of communication facilities, especially in relation to costs which are exacerbated further in these days where one must pursue a policy of frugal fiscal management. In educational regions, such as the South Western, where long distance communications are generally activated on a daily basis, STD charges cannot be avoided, but for obvious reasons need to be minimized wherever possible.

As quality communication is essential in our regional initiative of providing equipment and training for the use of electronic mail communication via Keylink was established in 1987. This initiative was funded jointly by the South Western Regional Office and the South Western Priority Country Area Program. All schools in the South Western Region possess this facility. Keylink is the form of electronic mail which was adopted by the

Queensland Department of Education late in 1986. Equipment required to use this facility includes a modem, cable and communications software which is utilised in conjunction with your existing computer and printer. A process using mailboxes accessed from a central clearing house in Melbourne has been established to facilitate the sending and delivery of messages. A flat rate charge per minute is effective for this service. This facility is widely used by students for curriculum activities within their regular classroom activities.

As technology has advanced and the cost of technological equipment decreases, the South Western Regional Office extended the communication project with the supply of facsimile machines to class four and five schools (one to four teacher schools). Due to location of these schools and their infrequent mail service, the facsimile machine is an additional asset to the organisation of the school. Charges for this facility utilise the STD rates as set by Telecom.

These projects have aided the quality of communication between students and staff not only within the South Western Region but also outside the region, interstate and overseas.

Computer Maintenance and Repair

Due to the large volume of computer hardware and peripherals in use in the schools in the South Western Region, it has been necessary to develop and implement a plan for the repair and maintenance of this equipment. A number of factors had to be taken into consideration when planning for this project and how it would operate. These included:

* vast distances to commercial computer repairers (freight charges);
* unsurfaced roads in poor condition;
* time equipment would be out of the school;
* dusty, hot climate (need for frequent services);
* expensive labour charges by commercial suppliers; and
* funding programs accessible to the region.

For the last three financial years the Department of Education in Queensland has given each region funding for the repair and maintenance of computers. In a region such as the South Western this funding alone is

not enough to cover our costs. It is in conjunction with the South Western Priority Country Area Program that a repair and maintenance program has been implemented in the region. A technical Maintenance Officer equipped with a workshop based in Charleville and fully outfitted van services all schools in the South Western Region for repairs and maintenance to computer equipment. This officer travels on circuits around the region visiting each school on a regular basis. Notification of his itinerary is via the communication facility of Keylink. In addition to repairs being effected by the Technical Maintenance Officer on site at the school, some equipment is taken back to the workshop in Charleville, if it is deemed necessary for major repairs. Itinerant personnel in the region are frequently used as carriers to return equipment or take broken equipment into the major pick up points in the region which are cleared once or twice a week.

With this process for the repairs and maintenance of computers, the funding received by Central Office of the Department of Education is used for the payment of parts needed to effect repairs. All other costs are borne by the South Western Priority Country Area Program in an attempt to overcome the isolation caused by distance. This program has been operating successfully in the region for some years now, and schools are continually lauding the fine efforts of the Technical Maintenance Officer and the Priority Country Area Program. The benefits to school by operating in this manner mean that there are absolutely no costs at all to be met by the school, and turn around time is very short.

Conclusion

The many programs involving technology which have been implemented in the South Western region have attempted to overcome disadvantage caused by isolation and distance, and to provide opportunities for country students equivalent to that of their counterparts in city schools.

Professional development and support for Principals and teachers has become more essential than the provision of equipment. In a region where staff turnover is high, a concentrated effort to keep personnel abreast of technologically advanced equipment is essential if quality communication is to be maintained.

In an article by Robert Cole entitled 'Ghosts in Small-Town Schools', he says:

> Many of these little towns are necessary outposts of life. They will keep the schools they have because there's simply no place else close enough for children to go to school - and because these places are home, in a society where the idea of home is becoming an abstraction not rooted in a place. *These places are home*: Like all homes, some are healthier than others. Like all homes, they are worthy of our best efforts (1990, p. 11)

References

Cole, Robert. (1990) Ghosts in Small-Town Schools. *International Journal* (Spring/Summer 1990) pp. 44-48 published and condensed in *The Education Digest,* volume 56, No. 8, pp. 7-11.